The Effects of European Integration on the Stability of International Trade: A Duration Perspective

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22. September 2014

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Abstract: I examine the effects European integration has had on intra-EU trade relationships between 1962 and 2005. I find that the stability of intra-EU trade relationships as reflected by their duration has been negatively affected by the persistent integration with duration decreasing and the hazard of trade ceasing increasing. The 1986 and 1995 expansions as well as the creation of the economic union in 1999 reduced the hazard, but not by a large enough magnitude to offset the increased hazard due to earlier integration actions. On the whole, intra-EU relationships have become shorter. This is largely due to the reduction in trade costs brought about by integration, which has enabled a plethora of short and previously cost-prohibitive relationships. This conclusion is supported by the tremendous growth of new relationships under the various incarnations of the European Union.

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I. Introduction

Since the late 1950s Europe has engaged in an experiment of unparalleled nature in history – the integration of a myriad of cultures, beliefs, and practices in a more cohesive unit. What started as the European Coal and Steel Community has evolved over time into a far broader and encompassing union currently known as the European Union. The creation of the Union was gradual, evolving over time through various incarnations. In the area of international trade, this integration first took root as a free trade agreement among the member countries, graduating to a common market in 1994, and finally establishing an economic union in 1999.

Every step of the integration process resulted in reduced costs of trading providing for less costly means of exchanging products via the reduction in tariffs, harmonization of standards, practices, and regulation, among other measures. Such reductions in trading costs have had far reaching effects for the growth of aggregate trade. During the time period covered by this study, 1962 to 2005, aggregate trade among the EU-15 countries grew by some 11,000%, while their combined GDP grew by less than 900%. Reductions in trade costs also have far reaching effects at a disaggregated level as they make it feasible to conduct more trade, by enabling trade which would otherwise be impractical or cost-prohibitive.

The goal of this chapter is to assess the overall effects of European economic integration on international trade at a disaggregated level, focusing on the effects on the stability of trade through the prism of duration of trade. Duration of trade examines how long a country imports a product from its trading partner, where the item of interest is a spell of service – continuous years during which trade is taking place. The pair of countries and the product being exchanged together define a trade relationship, while the number of consecutive years over which the relationship is active constitute a spell of service. Using annual UN COMTRADE data from 1962 combined with the Baier and Bergstrand (2007) Economic Integration Agreements Database as well as key dates pertaining to European integration, I examine how

European integration has affected duration of trade. Duration of trade was first investigated by Besedeš and Prusa (2006a,b) and Besedeš (2008) who focused on duration of U.S. import trade showing it to be surprisingly short. Nitsch (2008) was the first to investigate duration using an EU member country, examining duration of German import trade, finding it to be similarly short. Hess and Persson (2011) examine the duration of EU import trade using the same data as I use, but their focus was not on understanding the impact of the various aspects of EU integration, the sole focus of this chapter.

As Besedeš, Moreno-Cruz, and Nitsch (2014) show, both theoretically and empirically using data for virtually all available countries between 1962 and 2005, economic integration has a dual effect on international trade at a disaggregated level. As economic integration reduces trade costs, one can expect trade to increase and become more stable, or to put it in different words, to last longer. This is precisely the effect Besedeš, Moreno-Cruz, and Nitsch (2014) find – trade relationships which are active when an economic integration agreement enters into force become longer and are less likely to end or fail. However, lower costs also make it feasible to commence new trade relationships which would otherwise remain dormant. These relationships, by their very nature, are marginal, with small cost advantages realized from trading across borders. Such small cost advantages make for relationships which can easily end as their stability is not backed by large cost differences. As Besedeš, Moreno-Cruz, and Nitsch (2014) show, on average, trade relationships which begin after two trading partners enter into an economic integration agreement are indeed more fragile displaying a shorter duration and a higher likelihood of failure, a higher hazard of the relationship ceasing. Thus, economic integration agreements have been found to have a dual effect on the stability of trade relationships – they enhance the stability of already active relationships, but reduce the stability of relationships which start after the agreement is in place.

Besedeš, Moreno-Cruz, and Nitsch (2014) only focused on the effect of a generic economic integration agreement, without differentiating the nature of the agreement. In this chapter I go several steps beyond their basic investigation as the European Union present a unique opportunity to investigate

several different aspects of economic integration. First, I explicitly examine whether changes in the nature of European integration have different effects by examining whether the greater extent of integration provided by a common market and an economic union has additional effects beyond those conferred by the free trade agreement engaged into at the onset of European integration. The European Union (and its precursors) expanded gradually, adding additional members in several steps allowing me to examine the effects associated with expansion of the EU between 1962 and 2005. Accession to the EU is a carefully regulated process with each potential member having to apply for membership. This allows me to examine whether there are any anticipation effects stemming from countries announcing their intention to join the integration. In certain cases the EU has a free trade agreement in place with a future member prior to that country joining the EU, allowing me to examine whether such agreements have a differential effect compared to the effect of being in the EU.

II. Data

I use data pertaining to the EU-15, the member countries prior to the eastward expansion which started in the early 2000s: Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, the Netherlands, Portugal, Spain, Sweden, and the U.K. Such restriction stems from data availability. Trade data are sourced from the UN COMTRADE database. I use bilateral import data reported by the EU-15 member countries at the 4-digit SITC revision 1 level. Trade data are available annually from 1962.

Information on economic integration agreements comes from the Economic Integration Agreements Database compiled by Baier and Bergstrand (2007). The database records the various economic integration agreements that 195 countries have entered into between 1950 and 2005. Economic integration agreements are defined as being one of six types: non-reciprocal preferential trade

agreements, (reciprocal) preferential trade agreements, free trade agreements, customs union, common market, and economic union.

Given the intersection of the two datasets, my investigation spans the time period between 1962 and 2005. Given data on economic integration stop in 2005, I focus on the EU-15 and ignore the eastward expansion due to only being able to observe two years of EU-25 which is not a sufficiently long period to be able to obtain results about the effects of that round of expansion on duration of trade. I combine these data with key dates related to the expansion of the EU: dates when the nature of the EU changed, dates when future member countries applied for membership, existence and type of any trade agreement a future member had with the EU prior to joining it, and dates of every round of expansion between 1962 and 2003.

The EU went through four rounds of expansion on the way to becoming EU-15. The original members are Belgium, France, Germany, Italy, Luxembourg, and the Netherlands. The first enlargement occurred in 1973 when Denmark, Ireland, and the U.K. joined. The next country to join was Greece in 1981 followed by Portugal and Spain in 1986. The last expansion used in the analysis is that of Austria, Finland, and Sweden joining in 1995. For each round of the expansion I identify when the country began negotiating its accession. Denmark, Ireland, and the U.K. applied for membership twice in 1961 and 1967, as did Spain in 1962 and 1977. As application date I only use the date of the application which resulted in each country joining the union.

Austria, Finland, Portugal, Spain, and Sweden all had a trade agreement in place with the EU prior to joining. Spain had a non-reciprocal PTA while the other countries had a free trade agreement. I control for these agreements in order to precisely identify the effect of their accession to the EU. Finally, the EU became a common market in 1994 and an economic union in 1999, which I also control for explicitly. I use the standard gravity variables sourced from CEPII to control for country GDP, distance, common language, and common border.

III. Empirical Findings

III.1 Estimation strategy

In order to estimate the likelihood of a spell failing, I convert annual data to spells of service and estimate a random effects probit model, following Hess and Persson (2010) and Besedeš and Prusa (2013). In order to ascertain the magnitude of the effect of any variable I follow Besedeš and Prusa (2013) and Besedeš, Moreno-Cruz, and Nitsch (2014). I report differences in the fitted hazard at the mean values of all variables with the exception of the variable of interest. To be specific, in order to evaluate the effect of a single variable I will examine the difference in two fitted hazards: one with the value of the variable of interest taking a particular value, such as zero in the case of a dummy variable, and the other with the value of the variable of interest taking a different value, such as one in the case of a dummy variable, while all other variables are held at mean values for the sample or at zero in the case of dummy variables.

III.2 Explanatory variables

The set of explanatory variables follows Besedeš, Moreno-Cruz, and Nitsch (2014). Along with gravity variables, I include the log of the length of the current year of a spell to allow the hazard to change with duration and the initial volume of trade with which a relationship begins. The next set of variables pertains to economic integration agreements the EU-15 countries or the EU as a whole have with other countries in the world and are defined as in Besedeš, Moreno-Cruz, and Nitsch (2014). A dummy variable, 'EIA exists,' identifies pairs of countries which have an agreement at some point. Another dummy variable, 'EIA in effect,' identifies the years during which the agreement is active. The 'Start after EIA' dummy variable identifies spells which started after the agreement, while the 'EIA duration' measures how many years have passed since the start of the agreement.

Another set of variables identifies similar effects for intra EU agreements. 'EU pair' identifies instances where countries with a trade relationship are both (eventually) in the EU. Thus, in the instance

of trade relationships between Germany, a founding member, and Spain, which joined in 1986, this variable always takes the value of one, irrespective of the year. The 'EU in effect' dummy variable identifies the years when both countries are members of the EU, which in the case of Germany and Spain would be 1986 and beyond. 'Start after EU' identifies spells which started after both countries became members of the EU and 'EU duration' measures the number of years that have passed with both countries as EU members. This set of variables defines the basic specification, the results of which are reported in Table 1.

In the remaining columns I sequentially add additional variables identifying a particular aspect of the EU integration process. In the second column I add two dummy variables. 'Common market' identifies years during which the EU is a common market, while 'Economic union' identifies years during which the EU is an economic union. These two variables identify how the changing nature of the extent of EU integration affected the duration of intra EU trade relationships. The 'Application' dummy variable identifies years during which future member countries were applicants. The 'Pre-accession agreements' dummy variables identifies instances where future members had a trade agreement with the EU prior to them becoming a member. Finally, there are four dummies, one each identifying years following each round of expansions. 'Accession 1973' identifies all years after 1973 when Denmark, Ireland, and the U.K. joined the EU, 'Accession 1981' when Greece joined, 'Accession 1986' when Portugal and Spain joined, and finally 'Accession 1995' when Austria, Finland, and Sweden joined.

III.3 Results

While the EU specific variables are added sequentially, I will focus in my discussion on the specification in the last column of Table 1, which includes all variables described above. In Table 2 I report the average effect on the hazard corresponding to integration related variables and their effects in the last column of Table 1. These were obtained by fitting the hazard and changing the value of the variable of interest as described above. Before focusing on EU specific variables, a short discussion of the effects

of other variables is in order. The length of a spell has a negative effect on the hazard of trade relationships ceasing, indicating that the longer the spell, the less likely it is to cease. Initial volume has a similar effect reducing the hazard. Importer GDP has a positive effect, indicating that the larger the EU member, the shorter lasting are its import relationships. The larger the exporter, the less likely are the relationships to cease. The larger the distance between the two countries in a trading relationship, the higher the hazard. Common language and common border both reduce the hazard and make for longer and more stable relationships. The estimated effects of these variables are stable across all five estimated specifications and are similar to those obtain in the literature.

Relationships where only one country is an EU member and where the two countries at some point have an economic integration agreement do not have a particularly different hazard than country pairs which never have an integration agreement. In the first three specifications, the estimated coefficient is not significant and is almost equal to zero, while in the last two columns it is statistically significant and small. Estimating the fitted hazard with all variables pertaining to integration agreements and EU specific variables at zero, and changing the 'EIA exists' dummy from zero to one, reveals that that relationships between an EU 15 country and a non-EU trading partner who at some point have an economic integration agreement have a hazard lower by an average of 2.6%. The onset of such an agreement significantly reduces the hazard, by an average of 48.3%.[2] This indicates that countries which sign a free trade agreement with the EU experience a large positive stability shock to their already active trade relationships which become longer lasting. Despite the large pro-stability shock experienced by already active spells, the spells which begin after such agreements experience more than four times as large a negative shock to stability, having a 203.7% higher hazard. The longer the agreement is in place confers a small pro-stability boost of on average 7.9% lower hazard per year.

[2] While the discussion talks about an agreement between an EU member country and a non-member country, I should point out that EU has a common policy for economic integration agreements which prevents a single member from having standalone agreements with non-members.

	Basic	Nature of EU	Application period	Pre-accession agreements	Accession
Duration (ln)	-0.527***	-0.527***	-0.527***	-0.530***	-0.532***
Initial volume of imports (ln)	-0.108***	-0.109***	-0.109***	-0.109***	-0.111***
Importer GDP	0.061***	0.060***	0.060***	0.054***	0.062***
Exporter GDP	-0.078***	-0.078***	-0.078***	-0.079***	-0.079***
Distance (ln)	0.113***	0.114***	0.114***	0.114***	0.114***
Common border	-0.252***	-0.253***	-0.253***	-0.242***	-0.191***
Common language	-0.027***	-0.028***	-0.028***	-0.028***	-0.055***
EIA exists	-0.004	-0.001	-0.001	-0.011**	-0.012**
EIA in effect	-0.274***	-0.272***	-0.272***	-0.277***	-0.275***
Start after EIA	0.531***	0.530***	0.530***	0.528***	0.527***
Length of EIA in place (ln)	-0.011***	-0.011***	-0.011***	-0.010***	-0.012***
EU pair	-0.079***	-0.078***	-0.078***	-0.153***	-0.158***
EU in effect	-0.186***	-0.249***	-0.249***	-0.189***	-0.317***
Start after EU	0.077***	0.074***	0.074***	0.076***	0.099***
Length of EU in place (ln)	0.105***	0.147***	0.147***	0.149***	0.160***
Common market		0.026***	0.026***	0.028***	0.048***
Economic union		-0.176***	-0.177***	-0.163***	-0.141***
Application period			0.000	0.057***	0.050***
Pre-accession agreements				0.259***	0.203***
1973 accession					0.179***
1981 accession					0.249***
1986 accession					-0.025***
1995 accession					-0.050***
Constant	0.186***	0.189***	0.189***	0.302***	0.183***
Observations	6,578,177	6,578,177	6,578,177	6,578,177	6,578,177
Number of relationships	611,243	611,243	611,243	611,243	611,243
ρ	0.212***	0.211***	0.211***	0.208***	0.210***

***, **, and * indicate significance at the 1%, 5, and 10% levels.

Table 1 – Hazard Estimates

Relationships in which both countries are members of the EU have a significantly lower hazard by an average of 32.6%. Spells which are active when both countries join the EU have a significantly lower hazard, experiencing a reduction in the hazard of 52.9%. Relationships which begin after both countries are members of EU have a significantly higher hazard by an average of 25.7%. Note that the effect of both of these variables is partial in nature as it does not allow for a differential effect that each round of accession might have had, as I discuss below.

EIA exists	-2.6%
EIA in effect	-48.3%
Start after EIA	203.7%
Length of EIA in place (ln)	-7.9%
EU pair	-32.6%
EU in effect	-52.9%
Start after EU	25.7%
Length of EU in place (ln)	190.7%
Common market	11.6%
Economic union	-28.2%
Application period	13.8%
Pre-accession agreements	58.3%
1973 accession	48.3%
1981 accession	72.6%
1986 accession	-5.1%
1995 accession	-11.6%

Table 2 – Average Estimated Effects on the Hazard

The longer both countries have been in the EU, the hazard of their trade relationships increases tremendously, averaging a staggering 190% per year. This effect applies to both relationships started before and those started after both countries were in the EU. The size of this effect bears some additional explanation. When calculating the average effect I assume that the effect starts in year one of the spells which is also the first year of both countries being in the EU. Thus, the length of being in the EU increases in parallel with the length of the spell. Over the first ten years, the effect averages to a 57% higher hazard, over the next ten years it averages 151%, and during the third decade by 221.6%. The size of this effect and the rate at which it increases with time indicates that intra-EU trade becomes increasingly less stable and on average of significantly shorter duration.

The conversion of the EU from a free trade agreement to a common market in 1994 resulted in a small and significant increase in the hazard, on average 11.6%. Note that the effect of the conversion to a common market is not sufficiently strong to offset the pro-stability effect the EU has on relationships active when both countries join the EU, indicated by the 'EU in effect' variable. The creation of the economic union had the opposite effect, reducing the hazard by a larger magnitude of 28.2%, creating

significantly longer and more stable relationships. The positive effect of an economic union is sufficiently strong to offset the negative effect the EU has on relationships which start after the EU is stablished or a country joins it, but not the increase in this effect over time. This indicates that an economic union may have a fundamentally different effect on the stability of trade relationships than any other type of economic integration agreement.

During the application period trade relationships between the applicant country and an EU member have a higher hazard of 13.8%, but only after the pre-accession agreement and the accession rounds are taken into account. In terms of the stability of trade relationships, there are no positive anticipation effects, but rather only negative ones increasing the hazard. The existence of a pre-accession agreement significantly increases the hazard of relationships ceasing, on average by 58.3%.

Finally, as suggested above, note that each round of expansion of the EU has a different effect on the hazard of trade relationships ceasing. The 1973 and 1981 expansions both significantly increased the hazard for both old and new members, by 48.3% and 72.6%, the latter of which is the additional effect which starts in 1981. The 1986 and 1995 expansions had very different effects, both reducing the hazard by 5.1% after 1986 and by 11.6% after 1995. While the last two rounds of expansion reduced the hazard, the magnitude of the reduction was not sufficiently strong to offset the increases caused by the 1973 and 1981 expansions.

The effects of estimated coefficients described in this section are what I will describe as pure effects, occurring in isolation from changes in other variables of interest. For example, the full effect of joining the EU on already active spells is not given just by the 'EU in effect' variable but also by one of the accession dummies. The 'EU in effect' variable identifies the effect of EU common across all observed relationships of that kind. To better ascertain the effect of the various variables in the following section I discuss several specific scenarios of the various effects generated by EU integration.

IV. Specific Scenarios

In order to examine the various consequences of European integration, I examine the combined effects of the EU integration related variables by examining four specific scenarios. Across all scenarios, I fix all gravity variables at their sample means and all variables specific to economic integration agreements with non-EU countries at zero, thus focusing only on the effect of the variables of interest. I then estimate the fitted hazard for specific values of EU integration variables to ascertain their combined effects and contrast the fitted hazard to the one where the variables of interest are set to zero (i.e., the hazard in the absence of a specific aspect of EU integration). I examine four scenarios: (i) the consequence of upgrading the EU from a free trade area first to a common market then to an economic union; (ii) the effect of the 1973 expansion with a 3-year application period; (iii) the effect of the 1986 expansion with a 3-year application period preceded by a 10-year economic integration agreement; and (iv) the effect of all four rounds of expansion, each preceded by a 3-year application period.

In order to examine the differential effect of variables of interest I need to specify the timing of various effects with respect to a given spell. There are two aspects to timing assumptions. One has to do with when during an active spell the integration event takes place, while the other has to do with how long after (joining) the EU the spell starts. As far as the former is concerned, I will assume that the first integration event of interest occurs in the fifteenth year of a spell. As far as the latter is concerned, I will examine two possibilities one having the spell start immediately after EU is formed or joined, while the other has the spell starting 10 years after the EU is in place. Both of these assumptions are arbitrary in nature, and changing any aspect of the timing would not affect the results qualitatively. In each scenario I set the value of the 'EU pair,' 'EU in effect,' and 'Start after EU' dummy variables to one. For each scenario I plot three fitted hazards, one with the variable(s) of interest set to zero and two with the variable of interest set to one with each plot corresponding to a particular set of timing assumptions: one for spells which started in EU's first year and the other for spells which started in EU's tenth year. I then focus on

the differences across the three plots. Each fitted hazard is plotted along with the corresponding 99th percentile confidence interval. Should the confidence intervals of any two plotted hazards overlap, then the effect of the variable(s) of interest are not statistically significant.

IV.1 Upgrading the EU

The effects of the first scenario are shown in Figure 1 and examine the effects of upgrading the EU from a free trade agreement to a common market and then to an economic union, the latter upgrade following the former one after six years, as was actually the case. Aside of the basic EU related variables, all other aspects of EU integration (application period, pre-accession agreements with the EU, and EU expansions) are set to zero.

The effects of upgrading the EU from a free trade agreement to a common market and then an economic union are apparent, but are not particularly large. The conversion to a common market increases the hazard by some 11% relative to the EU remaining a free trade agreement. The subsequent conversion to an economic union reduces the hazard more than the increase caused by a conversion to a common market. The hazard under economic union is some 20% lower relative to the hazard of the EU as a free trade agreement. While somewhat difficult to read from the picture, both effects are statistically significant.

Note that both effects are significantly smaller in magnitude than the effect on the hazard of having more time pass since the formation of the EU. The only difference over the first fifteen years between the plots in Figure 1 is that highest hazard is for spells which start ten years after the EU itself starts. While the difference between the two hazards decreases with duration, starting at 52% higher hazard for the later starting spell in year one and decreasing to 20% in year fourteen, the difference averages to 33%. Spells which start ten years after the EU have by a third higher hazard than spells which started at the same time as the EU itself. Thus, even absent any other integration changes within the EU, the establishment of the EU itself increases the hazard by a large amount over time.

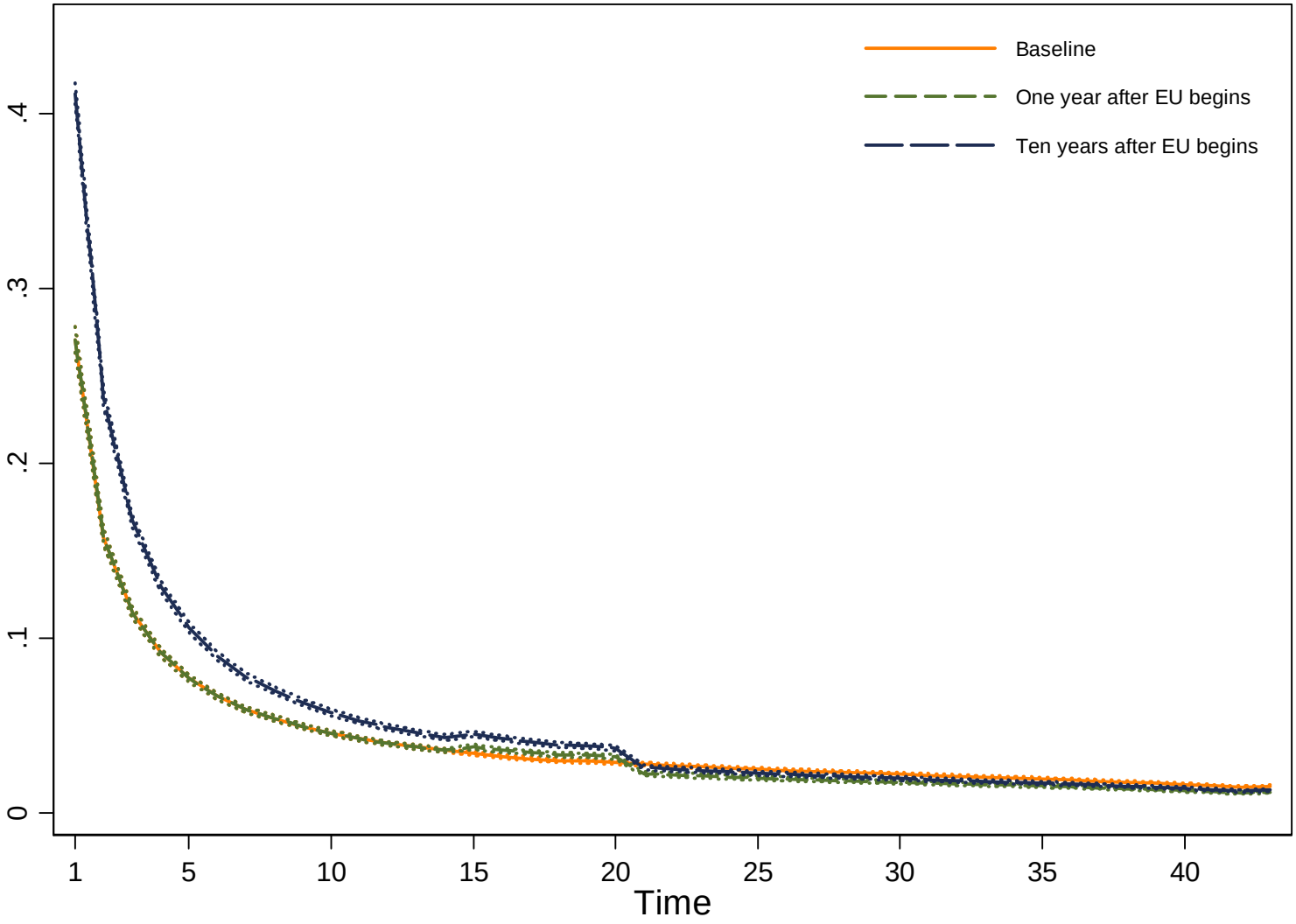

Figure 1 – EU Upgrades

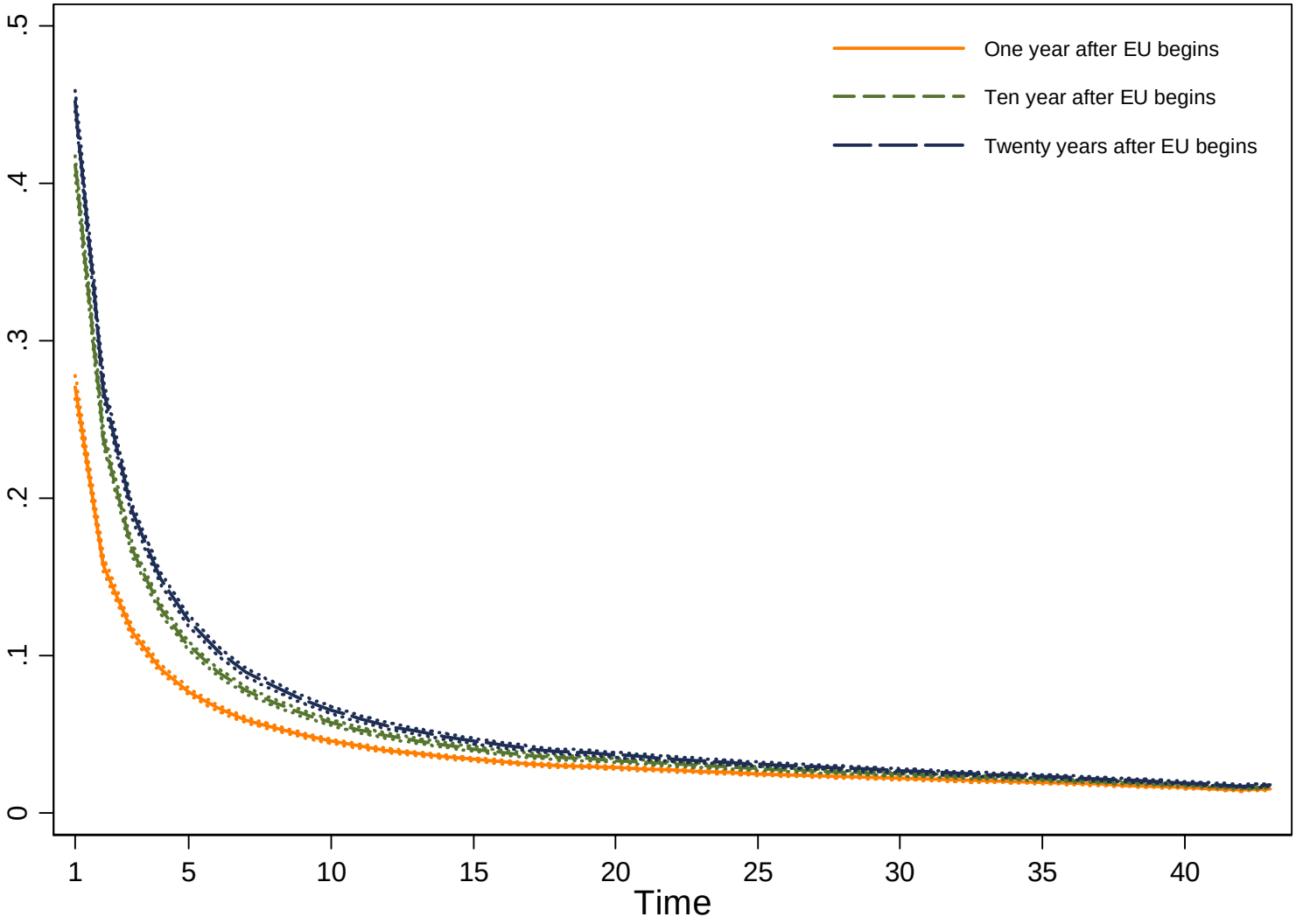

Figure 2 – The Effect of the Age of EU

To better examine the increase in the hazard with time after the establishment or accession to the EU in Figure 2 I plot three different fitted hazards for EU relationships started after the establishment of the EU, reflecting the effect the age of the EU or joining the EU itself has on the hazard. I compare spells which started immediately after (joining) the EU, spells which started ten years after (joining) the EU, and spells which started twenty years after (joining) the EU. As the figure indicates, the later a spell starts after the establishment of the EU, the higher its hazard. The first year hazard of the spell which starts ten years after the EU is 52% higher while the first year hazard of a spell which starts twenty years after the EU is 67% higher than that of the spell which starts immediately after the EU. These differences decrease with duration so that the hazard in year ten is 26% higher for spells which start in EU's tenth year and 43% higher for spells which start in EU's twentieth year. Spells which start in EU's tenth year have on average across the entire length of a spell (43 possible years) a 19% higher hazard, while those which start in EU's twentieth year have on average a 32% higher hazard. Spells which start in EU's twentieth year have on average 11% higher hazard across all years than those which start in EU's tenth year. While the hazard of spells which start after EU increases the later in the EU a spell starts, the hazard increases at a decreasing rate.

IV.2 The 1973 Expansion

The second scenario I examine is the effect of the 1973 expansion of the EU which added Denmark, Ireland, and the U.K. as members. For this scenario I define the EU as a free trade agreement for the duration of the spell and ignore the upgrade to a common market and an economic union. I fit the hazard for a spell for which the expansion occurs in the 15^{th} year of an active spell assuming there is a three year application period prior to expansion. Figure 3 displays the three fitted hazards. The application period increases the hazard slightly, by an average of 13% during the application period for spells which started immediately after the EU (one can think of this scenario as examining the effect of the expansion on incumbent members) and by a slightly larger 15% for spells which started in EU's tenth year.

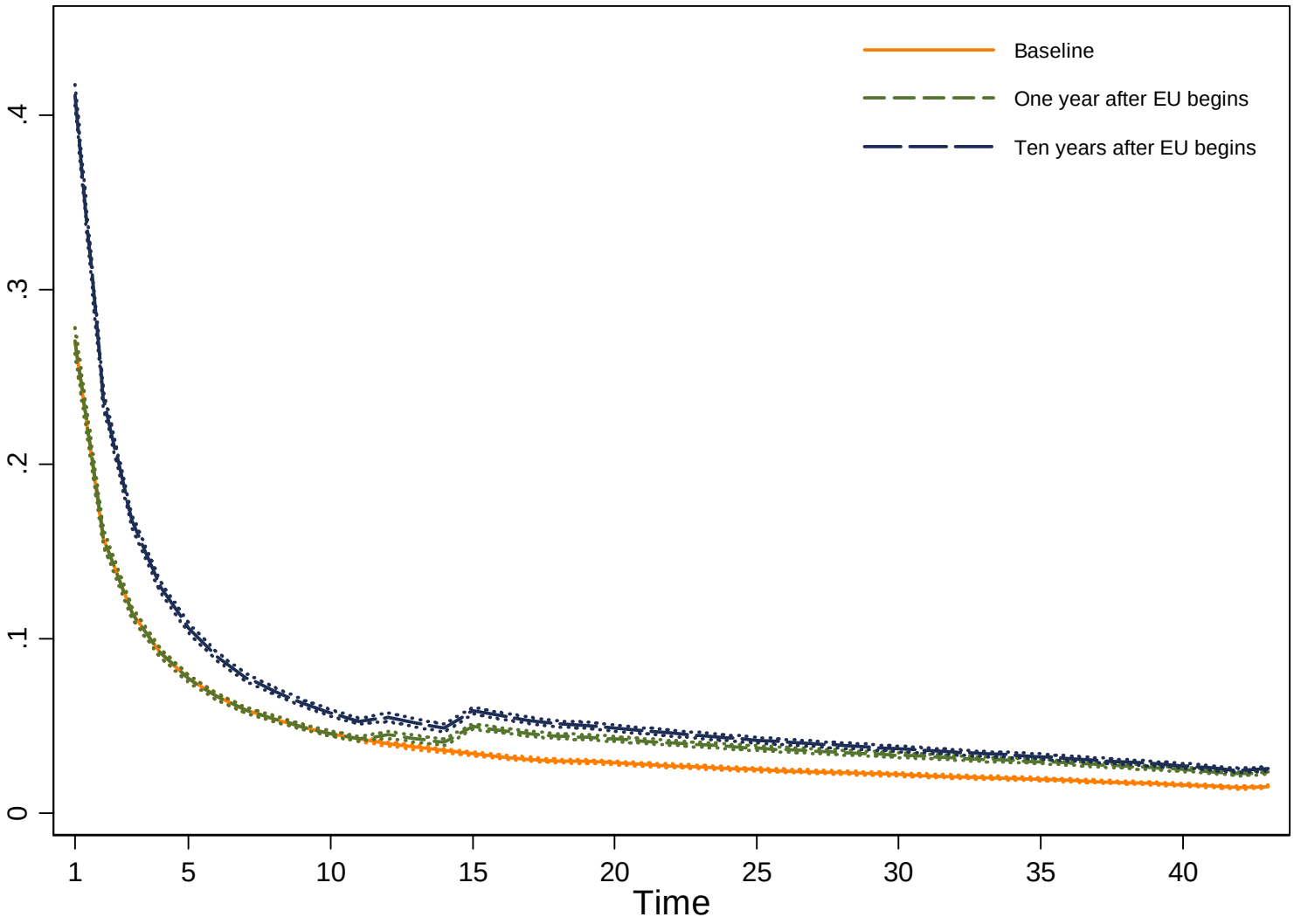

Figure 3 – The First EU Expansion

The 1973 expansion increased the hazard by an average of 50% for spells which started in EU's first year, and by 67% for spells which start in EU's tenth year relative to the hazard without the expansion.[3] Note that this increase is separate from the application effect as the application effect is present only during the three years immediately preceding the expansion itself.

IV.3 Pre-Accession Agreements with the EU

Spain, Portugal, Austria, Finland, and Sweden all had a trade agreement with the EU in place prior to joining the EU. Spain signed a non-reciprocal preferential trade agreement with the EU in 1970, sixteen years before joining the EU. Portugal, Austria, Finland, and Sweden signed a free trade agreement with the EU in 1973, thirteen years prior to Portugal joining and twenty two years prior to Austria, Finland, and Sweden joining. I now examine the effect of pre-accession agreements coupled with the 1986 and 1995 expansions when countries which had such agreements joined the EU. The effect on the hazard for the 1986 expansion is shown in Figure 4.

The pre-accession agreement increases the hazard by an average of 50% for spells which started as soon as the EU and by 88% for spells which started 10 years after the EU. Roughly a quarter of the increase for the latter spells is due to the higher hazard caused by the EU having been in place for ten years. The three-year long application increases the hazard by an additional 22% for the former spells and 16% for the latter. The accession eliminate the higher effect of the application period and reduces the hazard to less than what it would be in the absence of the expansion. The reduction is on average about 5% for spells which started in the first year of the EU. For spells which started in EU's tenth year there is a reduction in the hazard, but the effect is not strong enough to offset the higher hazard due to a later beginning of the spell with the EU. Such spells have on average a 7% higher hazard than would be

[3] My choice of spells which start in EU's first year and EU's tenth year and then experience the 1973 expansion in their 15th year implies that I am looking at spells of countries which joined the EU in 1958 and 1948. Spells which started in 1958 would correspond to the founding members, while spells starting in 1948 do not correspond to any real spell. It is best to think of such spells as thought experiments. I could have chosen to examine spells starting in specific calendar years, but that would make it for more difficult comparisons.

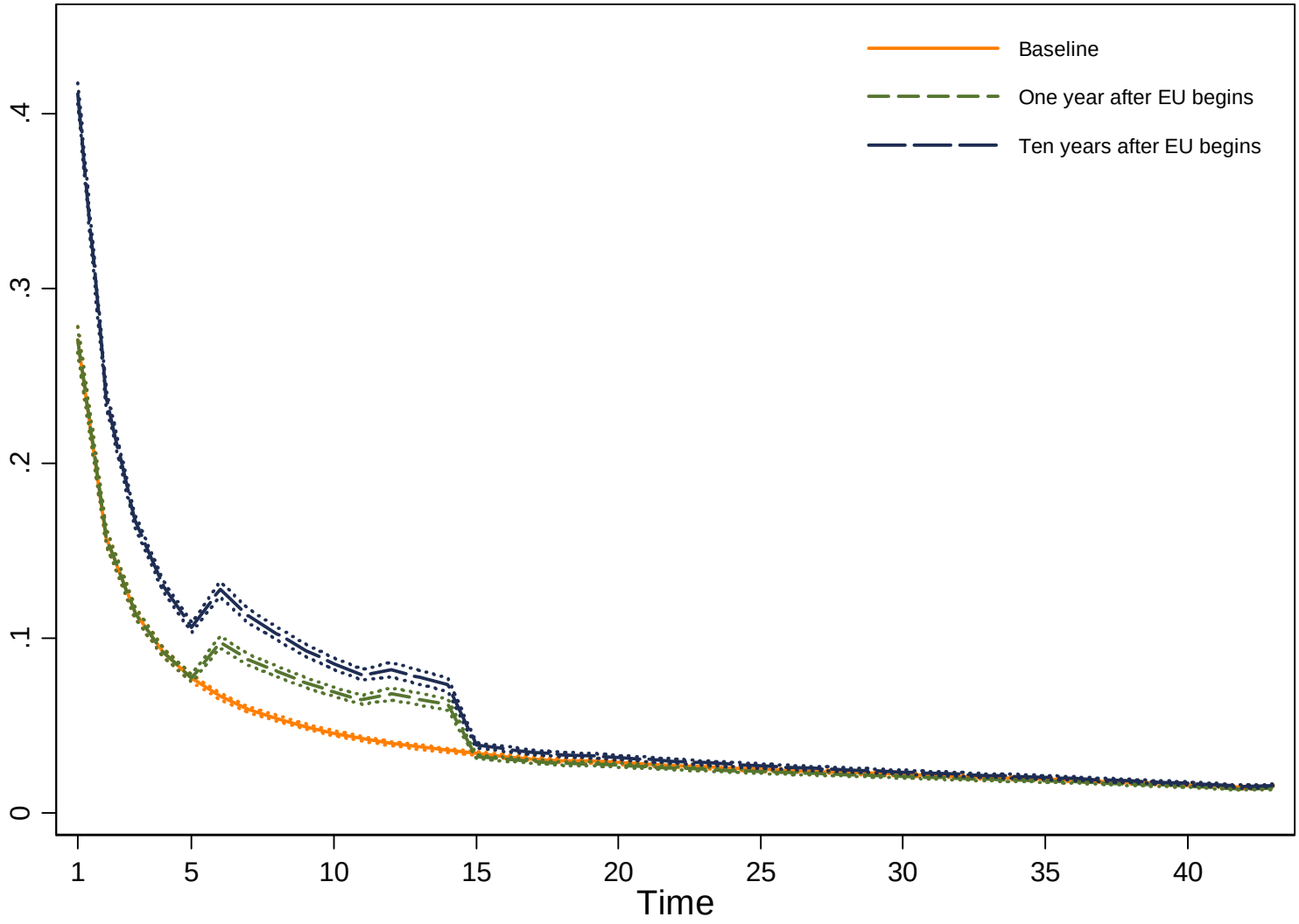

Figure 4 – The 1986 Expansion with a Pre-Accession Agreement with the EU

the case in the absence of expansion. Thus, in the case of the 1986 expansion, the expansion itself had a more stabilizing effect as it reduced the hazard for spells which were affected by the expansion. The corresponding effects for the 1995 expansion are stronger, reducing the hazard after accession by 12% for spells starting as soon as the EU is formed and largely having no additional effect on the hazard for spells which start when the EU itself is 10 years old.

IV.4 All Expansions

The last scenario I consider is that of all four rounds of expansion with a three-year application period leading up to every accession. The dummy variable for each accession takes on the value of one in every year after the accession, including years when other accessions occurred. To be more specific, the dummy capturing the 1973 accession takes on a value of one starting in 1973 and stays at one even after the 1981, 1986, and 1995 accessions. Thus, the full effect of the 1981 accession for example combines the effect of the 1973 accession with that of the 1981 accession dummies. The fitted hazards are shown in Figure 5.

The effects of the four expansions on the hazard are diverse. The first application period increased the hazard by an average of 13% followed by an increase of 47% following the expansion. The application period preceding the second round increased the hazard by an additional 20%. While the effect of the second application disappears when expansion occurs, the second expansion increased it by an additional 80% over the hazard during the second application, and doubles the hazard relative to what it was after the first expansion. At this point, the increase in the hazard relative to what it would be in the absence of both expansions is 147%. The application period preceding the third expansion increases the hazard by 32%, but the expansion itself reduces it by a slightly larger 37%. Thus, the third expansion offsets the entire increase during the third application period and reduces the hazard relative to what it was after the second expansion by roughly 5%. The application period before the last expansion increases the hazard by 35%, but the actual expansion reduces the hazard by 52% relative to the preceding application period

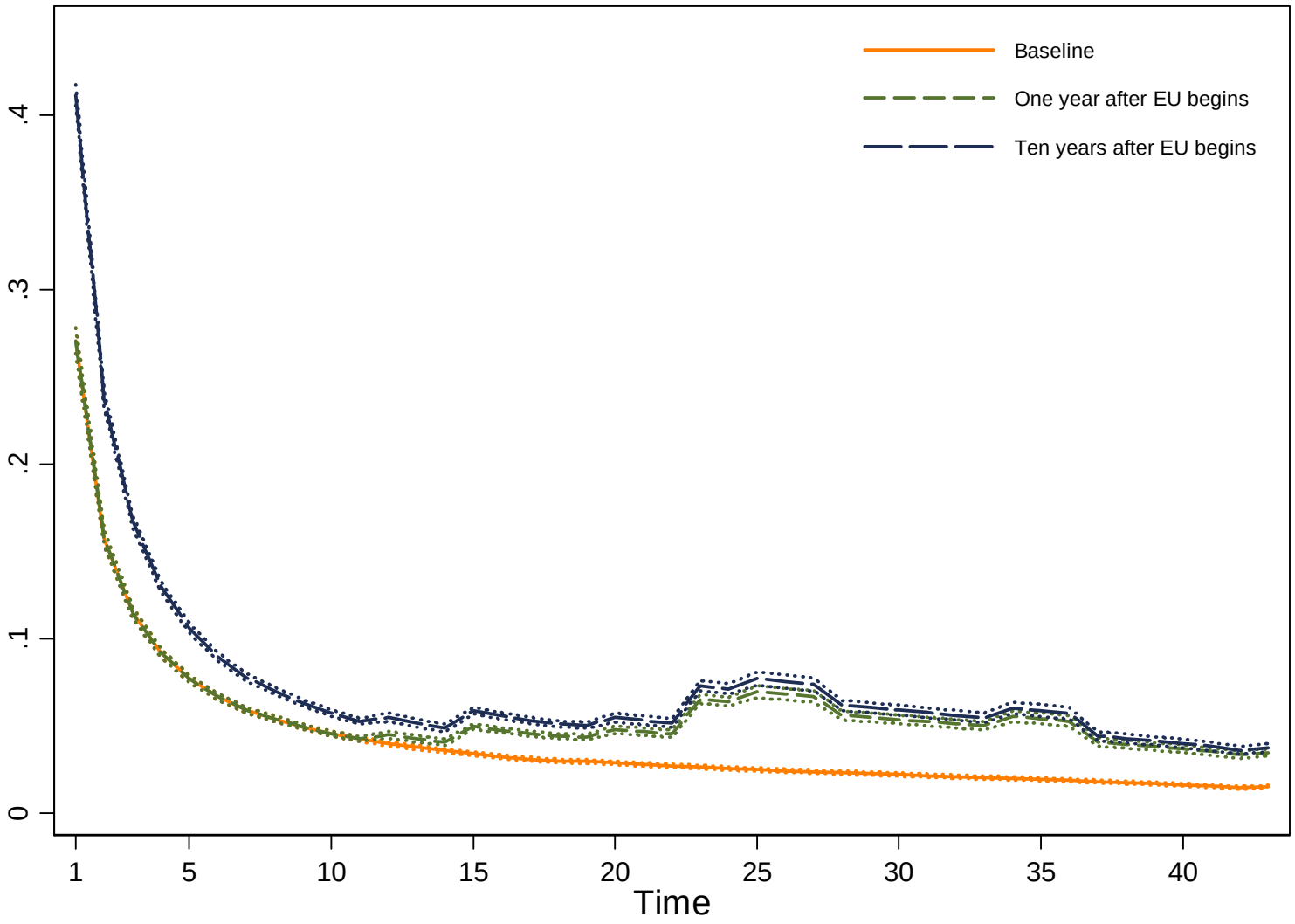

Figure 5 – Effect of All Four Expansions

and by 17% relative to what it was after the third expansion. While the last two rounds of expansion of the EU reduce the hazard, the effects are not sufficiently strong to offset the increased hazard from the first two rounds. After the last expansion the hazard is higher by more than 120% relative to what it would have been in the absence of any of the four rounds of expansion.

V. Discussion

The examination of the effects of the various aspects of European economic integration under the EU reveals that additional integration which occurs and the expansion of EU make for a more uncertain and less stable trading environment. The hazard of trade relationships ceasing is higher after every instance of additional integration than it was in earlier times. The magnitude of these effects is in some instances staggering. After the second round of expansion in the early 1980s the hazard of trade relationships increases by almost 150%. The subsequent expansion rounds reduce the hazard somewhat, but still leave it more than twice as high as it would be in the absence of any expansion of the EU. The conversion of the EU to an economic union from a common market also reduces the hazard, but by a relatively modest 20%. Trade within the EU has become significantly less stable through successive rounds of additional integration.

An obvious question imposes itself considering these results: given the large and potentially counterintuitive effects of European integration on the stability of disaggregate trade patterns, should we consider these effects to be negative and undesirable? To put it differently, what can we say about the economic welfare consequences of European integration when it comes to disaggregated trade? On the one hand we have a staggering growth in aggregate trade of some 11,000% between 1962 and 2005, but on the other hand we are confronted with large increases in the hazard and more fragile trade relationships. One could ask the question of where the aggregate growth came from if trade relationships have become significantly shorter on average.

One tantalizing possibility is that European integration has had a large effect on the ability of EU members to start trading with each other by significantly reducing the costs of trading. As discussed above, it is possible trade cost reductions make fringe trade relationships more likely to be attempted as they are no longer cost prohibitive. This is one of the fundamental premises behind any cross-border economic integration – reduce the costs of economic interaction to generate new activity. It is possible that reduced costs have had a significant effect on the extensive margin enabling the creation of many more trade relationships, a large number of which may have been marginal relationships which turned out to be short. But these relationships would not have been possible in the absence of integration. Thus, it is possible that the large increases in the hazard post integration are the consequence of integration enabling a large number of what turn out to be short relationships, which would not exist in the absence of integration. If that is the case, then despite the increase in the hazard, integration would have a beneficial effect as it enables trade relationships, however short, which otherwise would never have been realized.

I examine this possibility by calculating the number of new relationships created every year for every country pair in the data and regressing its logged value on the same set of variables used to examine the effect of European integration on the hazard of trade relationships ceasing. The only difference in variables used is that the two 'Started after' dummies can no longer be used since each spell generates a single observation now. In other words, 'EU in effect' and 'Started after EU' are now identical variables. The results are presented in Table 3 which contains the same progression of specifications as in Table 1.

In my discussion I focus on the last column of Table 3. Larger countries form more new relationships as do countries which are closer and surprisingly countries which do not share a border. The border effect may be a function of the data set composed of all EU import relationships, where most EU members share a border, in which case most of the EU related common border effect will be identified by EU related variables. Countries sharing a common language form more relationships. Non-EU member

countries who have an economic integration agreement with the EU do not start more relationships, but they do form more relationships after their agreement with the EU begins. The number of newly formed relationships decreases somewhat after an agreement begins.

	Basic	Nature of EU	Application period	Pre-accession agreements	Accession
Importer GDP	0.160***	0.160***	0.160***	0.160***	0.175***
Exporter GDP	0.021**	0.021**	0.022**	0.022**	0.023**
Distance (ln)	-0.046**	-0.043**	-0.043**	-0.043**	-0.042**
Common border	-0.720***	-0.741***	-0.745***	-0.746***	-0.731***
Common language	0.081*	0.081*	0.081*	0.081*	0.085*
EIA exists	0.070	0.077	0.087	0.087	0.095
EIA in effect	0.492***	0.495***	0.511***	0.507***	0.495***
Length of EIA in place (ln)	-0.028***	-0.029***	-0.031***	-0.031***	-0.031***
EU pair	0.066	0.085	0.182**	0.192**	0.204**
EU in effect	4.404***	3.010***	2.913***	2.905***	2.723***
Length of EU in place (ln)	-0.408***	-0.277***	-0.275***	-0.275***	-0.263***
Common market		-0.253***	-0.260***	-0.259***	-0.290***
Economic union		-0.408***	-0.414***	-0.414***	-0.459***
Application period			-0.539***	-0.550***	-0.561***
Pre-accession agreements				-0.045	-0.072
1973 accession					0.068*
1981 accession					0.186**
1986 accession					-0.019
1995 accession					0.179***
Constant	-5.746***	-4.567***	-4.588***	-4.590***	-4.684***
Observations	77793	77793	77793	77793	77793
No. Subjects	2757	2757	2757	2757	2757
R^2	0.040	0.040	0.040	0.040	0.041

***, **, and * indicate significance at the 1%, 5, and 10% levels.

Table 3 – Entry Estimates

EU members do create more relationships, both before and after becoming a member. The magnitude of the increase in the number of relationships after both EU members are in the EU is staggering. The semielasticity of 2.723 translates to a 1,423% increase in the number of relationships under the EU. While the rate of creation of new relationships decreases with the age of the EU, it does so very slowly. Forty years into the EU, the rate of formation of new relationships is still 472% higher than it would be in the absence of the EU. Transitions to a common market and an economic union both reduce

the rate of formation of new relationships by a modest 25% and 37%. The number of new relationships is also lower during the application process, by 43%, while any integration agreements with the EU prior to joining the EU have had no effect on the number of new relationships. The 1973 expansion had a small, marginally significant, and positive effect on the number of new relationships of 7%, while the 1981 expansion had a larger positive effect of 20%. The addition of Spain and Portugal in 1986 had no effect on the number of new relationships, while the 1995 addition of Austria, Finland, and Sweden has had a positive and significant effect on the number of new relationships increasing them by 20%.

VI. Conclusion

European integration has had a largely negative effect on the duration of trade within the EU increasing the instability of disaggregated trade patterns. The evidence presented in this chapter indicates that in the early stages EU integration had largely negative effects, reducing duration and increasing the hazard. This pattern reversed itself starting with the 1986 expansion which added Portugal and Spain to the ranks of the member countries and continued with the 1995 addition of Austria, Finland, and Sweden. The deeper integration which the EU began in 1993 by creating a common market and then in 1999 by creating an economic union also had a dual effect. The common market initial increased the hazard and reduced duration, but this was more than offset by the creation of the economic union after which the hazard dropped. However, the reduction in the hazard stemming from both the creation of the economic union and the 1986 and 1995 expansions was not large enough to offset the increased hazard from the first two rounds of expansion. The result of all of these changes is that the hazard of trade ceasing experienced by intra EU relationships after the creation of the economic union in 1999 was higher than the hazard experienced prior to the first expansion.

The evidence presented indicates that European integration while at the same time introducing additional instability into intra EU trade, increasing the hazard and reducing the duration of intra EU trade

relationships, also had a much larger positive effect on the number of new relationships. EU integration has allowed EU member countries to significantly increase the number of trade relationships among themselves by reducing the costs of trade, trade relationships which would likely not exist were it not for the integration processes. The large negative effects on duration of trade are likely largely driven by the large influx of newly created relationships, many of which may be one-off affairs, active for a very short period of time. At first blush such relationships may appear to be inefficient and generating more losses than gains. But in an environment of deep economic integration, where trading costs are very low, even short and small relationships may be efficient and profitable. As such, the reduction in the duration of intra-EU trade observed over the course of sustained EU integration is not a negative development, but rather a consequence of the EU reducing costs of trade and enabling many new relationships which used to be cost-prohibitive.

Data limitations prevented me from exploring the consequences of the eastward expansion of the EU which began in 2004. Given that the majority of new members after 2004 used to be very different economically than the EU-15, once data become available, it will be interesting to examine how the effects of continued integration of Europe compare to earlier phases.

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